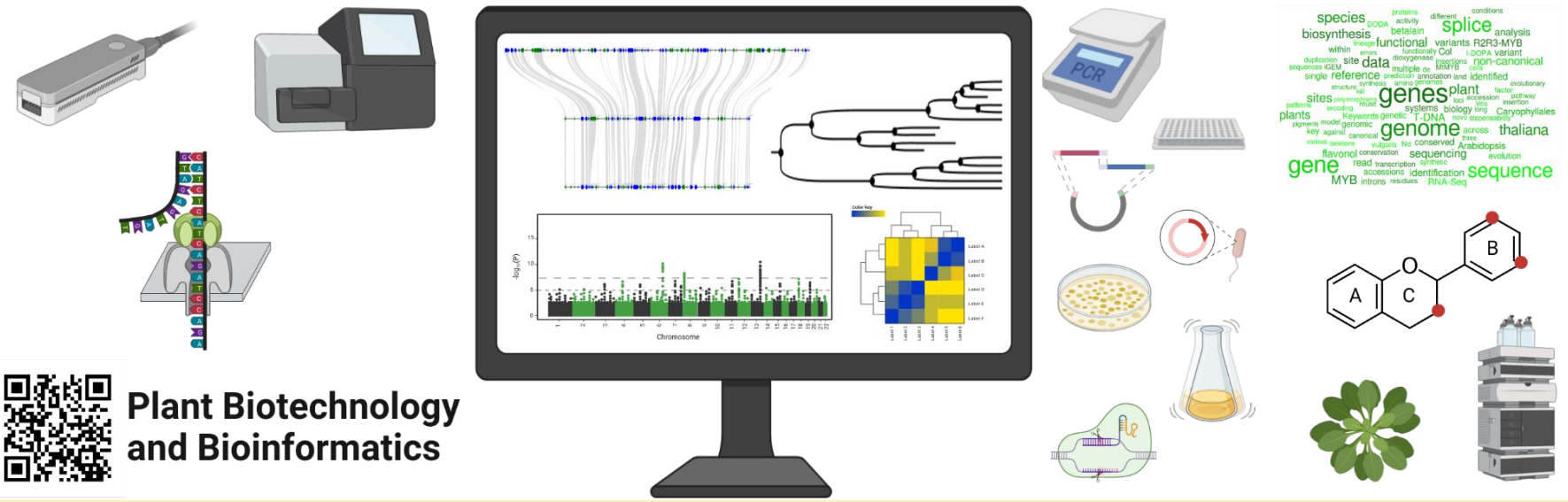
Technische Universität Braunschweig



Plant Biotechnology and Bioinformatics

Python - Functions

Prof. Dr. Boas Pucker (Plant Biotechnology and Bioinformatics)

Availability of slides

- All materials are freely available (CC BY) - after the lectures:
  - StudIP: ‘Python for Life Scientists’
  - GitHub: https://github.com/bpucker/teaching

- Questions: Feel free to ask at any time

- Feedback, comments, or questions: b.pucker[a]tu-bs.de

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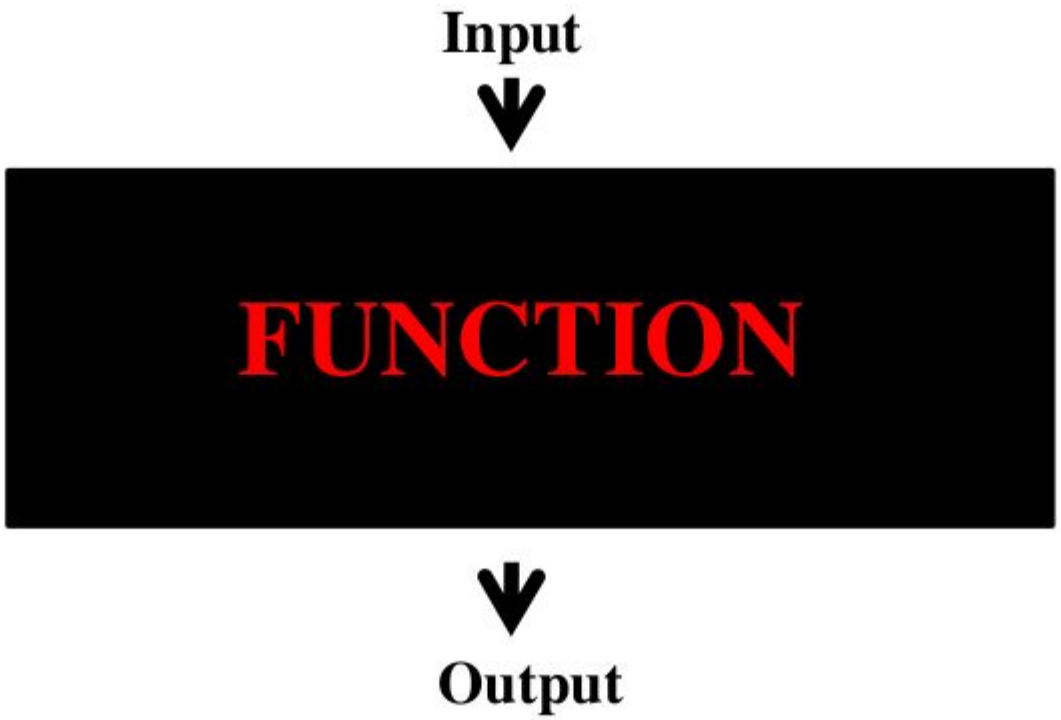
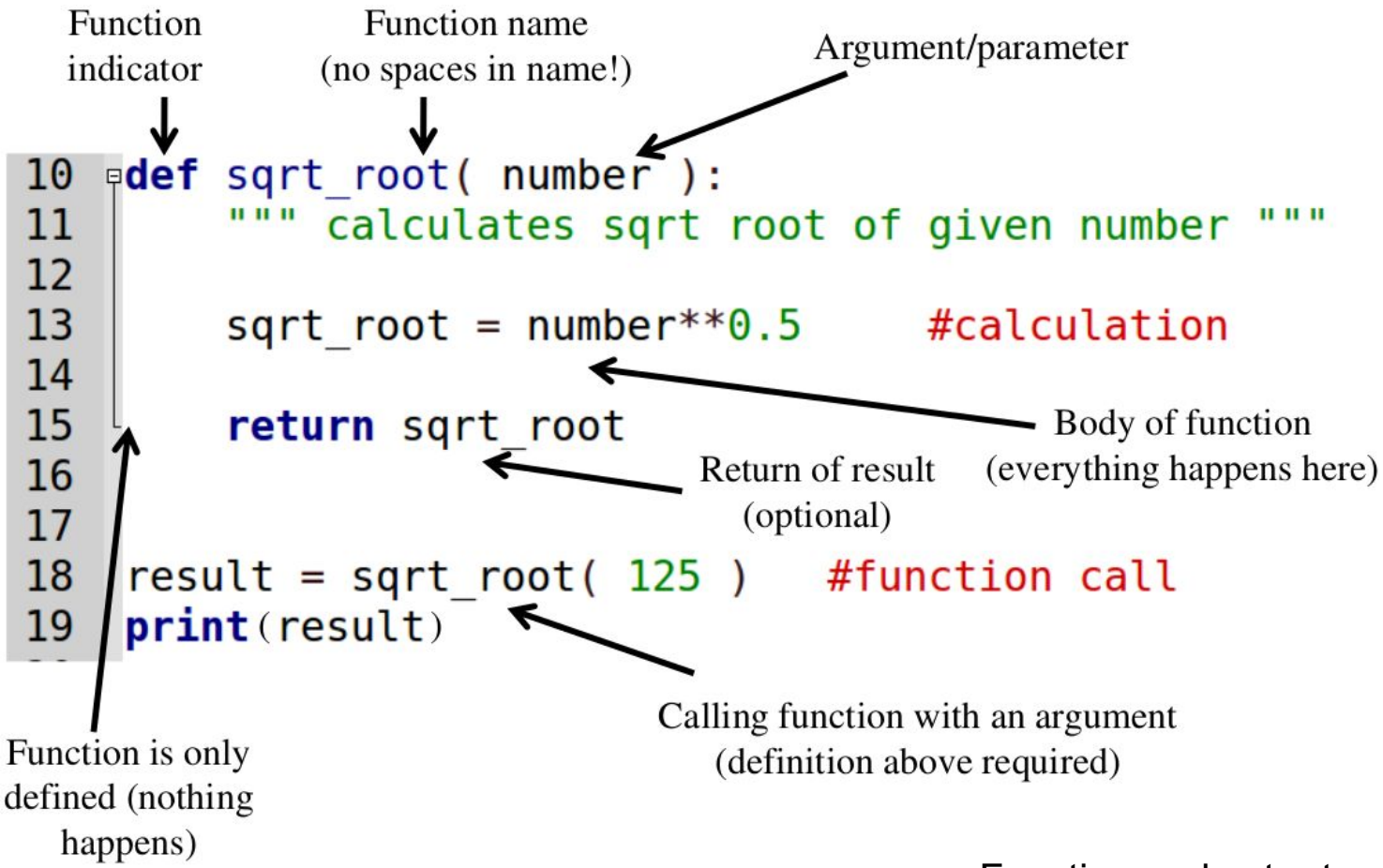
What is a function?



Elements of a function



Function ends at return
(following lines would be ignored)

Advantages of functions

- Generate modules: write it onces and apply it often (for different purposes)
- Structure: increase readability of your code
- Nested calculations are enabled by functions

```
1  def get_gc_content( seq ):
2      """ calculates GC content of given sequence """
3      return float( seq.count('G')+ seq.count('C') ) / len(seq)
4
5  gc_content = get_gc_content("ATGCGACTCAATGCA")
6  print(gc_content)
```

Important functions

- str(<VARIABLE>) #converts variable to string
- int(<VARIABLE>) #converts variable to integer
- float(<VARIABLE>) #converts variable to float
- <STRING1>.count('<STRING2>') #counts occurrences of string2 in string1
- <LISTE>.count(<LISTELEMENT>) #counts occurrences of element in list
- len(<STRING/LIST>) #calculate length of string/list
- Warning: Functions return error if invalid arguments (e.g. wrong variable type) are given!

Exercises - Part2

- Primer: ‘ATGCCATGCATTCGACTACG’
- 2.1) Calculate length of primer and print it!
- 2.2) Get number of Gs and print it!
- 2.3) Write a function to analyze the nucleotide composition of a primer and print it!
- 2.4) Write a function that calculates the annealing temperature?
  - 2+4 rule: A/T = 2 degrees; G/C = 4 degrees
- 2.5) Is it a suitable primer? Why (not)?

Time for questions!